BEFORE THE CANTERBURY REGIONAL COUNCIL

UNDER THE	Resource Management Act 1991
AND	
IN THE MATTER	of application CRC190445 by the Christchurch City Council for a comprehensive resource consent to discharge stormwater from within the Christchurch City area and Banks Peninsula settlements on or into land, into water and into coastal environments

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REBUTTAL EVIDENCE OF
MARK JAMES TIPPER FOR CHRISTCHURCH CITY COUNCIL
Dated 30 October 2018

CHRISTCHURCH CITY COUNCIL
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INTRODUCTION

1. My full name is Mark James Tipper. I here provide rebuttal evidence for the Christchurch City Council (**Council**) in relation to the evidence of other experts on the Council's application for a comprehensive stormwater network discharge consent (**Application**).

2. My qualifications and experience are as stated in my Evidence in Chief dated 15 October 2018.

3. I again confirm that I have read and agree to comply with the Code of Conduct for expert witnesses contained in the Environment Court Practice Note (dated 1 December 2014). I confirm that the issues addressed in the statement of evidence are within my area of expertise. I have not knowingly omitted to consider facts or information that might alter or detract from the opinions expressed. The Council as my employer has agreed to me giving this evidence on its behalf.

EVIDENCE RESPONDED TO IN THIS REBUTTAL EVIDENCE

4. I here respond to evidence provided by Trent Sunich and Mark Laurenson (on behalf of Z Energy Limited, BP Oil NZ Limited, and Mobil Oil NZ Limited (**Oil Companies**)). with regard to setting of total suspended solid (**TSS**) limits in relation to construction phase stormwater discharges. In providing this rebuttal I have also considered the evidence of Brian Norton (on behalf of Council).

EVIDENCE OF MR. SUNICH

5. I note the *Environmental Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand* (**Guideline**) referred to by Mr. Sunich in his paragraph 4.1(b) are dated 1998. Mr. Sunich acknowledges in his paragraph 6.2 that the Guidelines are currently under review to account for industry and practice (and presumably legislative) changes over the past 20 years, but concludes that the 1998 Guidelines currently sets the standard for the New

Zealand petroleum industry, describing what this means in paragraph 6.3 of his evidence, and stating in his paragraph 3.1(c) that in complying with the Guideline the Oil Companies are demonstrating best practice.

6. The Guideline focusses on managing discharges from established facilities; however no part of the Guideline addresses construction phase stormwater discharge management processes. The best management practice and treatment system design advice contained in the Guideline refers only to established facilities; there is no guidance on design, implementing, maintaining, monitoring or reviewing construction phase controls or management practices.

7. However, I note that section 8.2 of the Guideline addresses discharge water quality and states:

> "*In order to minimise the impact of discharges on the environment it is important to assess their impacts on the receiving waters and to take steps to avoid any adverse effects. In practice this is done by setting water quality targets… The point of compliance is usually the point at which the discharger loses control of the effluent. Generally, the maximum levels of contaminants allowable in stormwater systems which discharge into the environment or into reticulated district systems are:*
>
> *Total petroleum hydrocarbons = 15 mg/litre) averaged over the*
>
> *Total suspended solids = 100 mg/litre) design storm event*
>
> *Unless other levels can be justified by either a site-specific or generic assessment of effects…*
>
> *However, in setting these limits:*
>
> *(a) It is recognised that there will sometimes be periodic excursions under extraordinary storm conditions (see Sections 7.2 and 7.5.4).*
>
> *(b) It is the responsibility of site owners and operators to encourage lower levels of contaminant release…*
>
> *Sites which discharge into environments which are very sensitive to storm discharges should be the subject of individual assessments (or alternatively, generic assessments for sites of that nature).*"

8. The Guideline clearly includes the requirement to set a limit on discharge quality, to be measured at the point where the discharge leaves the treatment system. The Guideline also recognises that alternative (presumably tighter)

restrictions would be required for certain sensitive locations or receiving environments.

9. Further, the Guideline default limit for TSS is 100mg/l which equates to the 100g/m^3 proposed in my evidence. To avoid confusion between references to mg/l and g/m^3, in this rebuttal evidence I shall refer to both as parts per million (**ppm**). I note in his evidence that Mr. Sunich refers repeatedly to the 15mg/l TPH limit in the Guideline (such as paragraph 9.2 of his evidence that describes management of construction phase stormwater discharges), and uses this reference as a means for demonstrating consistency with the Guideline, but there is no reference in his evidence to the Guideline's TSS limit.

10. In paragraph 10.1 of his evidence Mr. Sunich argues against setting any TSS limit on construction phase discharges, instead recommending the "*implementation of best practice*" to manage construction phase stormwater discharges. Not only is this inconsistent with the Guideline, there is no description or definition of best practice for managing this type of discharge in either Mr. Sunich's evidence or the Guideline (the Best Practice measures describes in Appendix 3 of the Guideline describe management practices on established facilities only).

11. In paragraph 10.2 Mr. Sunich questions the ability to demonstrate or monitor in 'real time' compliance with a TSS limit. Section 9.5 of the Guideline describes the sampling protocol and laboratory processes required to demonstrate compliance with the limits established in section 8.2 of the Guideline. However, I agree with Mr. Sunich's comments that laboratory analysis to determine compliance 'after the fact' is unsatisfactory to Council and the practitioners alike.

12. There are a number of alternative means for determining compliance with TSS limits in 'real time' that I am aware have been satisfactory to Environment Canterbury on a number of sites. In no particular order, these include:

    a) electronic hand held TSS meter or Turbidity meter;
    b) clarity tube; and
    c) Sedimate

13. Sedimate is a laboratory calibrated tool for instantly, repeatedly, reliably and simply determining compliance with TSS limits. The other tools listed above require calibration by the operator in order to be accurate. Calibrating the other tools requires multiple sampling events to generate a calibration curve, and in my experience operators rarely take the time (or lack the skills/knowledge) to do this thoroughly.

14. Adoption of one of the above means to readily, reliably and repeatedly monitor compliance with a TSS limit provides the practitioner the tool required to proactively achieve and maintain compliance. Conversely I am not aware of any tool that readily enables compliance with the 15mg/l of TPH limit to be determined in 'real time'.

15. To summarise, the Guideline sets a TSS limit on stormwater discharges of 100ppm. This aligns with my Evidence in Chief. There are tools available to enable compliance with this limit to be determined in 'real time' by both the practitioner and the regulator. Whilst Mr. Sunich recommends adoption of best practice to ensure construction phase stormwater discharges are adequately managed (instead of a prescribed TSS limit), there is no information in his evidence or the Guideline to determine what this means, what standard(s) applies, or how compliance could be determined.

EVIDENCE OF MR. LAURENSON

16. In paragraph 8.4 of his evidence Mr. Laurenson states *"The MfE Guidelines are widely recognised in stormwater provisions in regional plans around New Zealand, either directly or indirectly."* In Appendix 3 of his evidence Mr. Laurenson provides a summary of approaches taken by 16 New Zealand territorial authorities to managing stormwater discharges from Oil Company sites. Of all those listed only one prescribes a TSS limit higher than 100ppm (Bay of Plenty Regional Council sets a TSS limit of 150ppm). Although it is unclear whether these limits apply to construction phase and/or post-construction phase discharges is unclear, however it does demonstrate that the majority of councils set a TSS limit of 100ppm for stormwater discharges (from Oil Company sites).

17. In paragraph 8.6 Mr. Laurenson proposes wording that incorporates the permitted activity TSS limits from rule 5.95 of the Land and Water Regional Plan. Although it appears that these limits are proposed to apply to established Oil Company sites (that is to say, not during construction phase), it is apparent that Mr. Laurenson accepts and promotes the use of TSS limits for managing stormwater discharges. Mr. Laurenson's proposed wording also incorporates the ability to amend the TSS limit "*where the background TSS in the waterbody is greater than 50g/m^3 in which case the Schedule 5 LWRP visual clarity standards shall apply*." This degree of flexibility in setting a TSS limit is similar to that proposed by Mr. Norton in his Evidence in Chief, however it is unclear how the 'background TSS in the waterbody' would be calculated.

18. In paragraph 10.2 Mr. Laurenson states in relation to construction phase stormwater discharges that "*a method-based specification is the most appropriate means of targeting a limit*." Mr. Laurenson does not describe the 'method-based specification' he proposes, instead referring to Mr. Sunich's evidence. Mr. Sunich's evidence does not provide this information.

19. The limitations of relying on Erosion and Sediment Control Plans (alone) are explained in paragraphs 25 to 28 in my Evidence in Chief. The difficulties of establishing a 'best practice' or 'method-based' approach to managing or setting a limit on construction phase stormwater discharges are complex, and I briefly mention this as an issue in paragraph 60 of my Evidence in Chief. Effective management of erosion and sediment control is more an art than a science. No two sites are the same, there are a great many influencing factors that need to be considered holistically and in concert, and there is a wide (and ever increasing) range of products and techniques available.

20. Whilst there are some aspects that can be determined scientifically (such as sizing of a decanting earth bund or sediment detention basin), in my experience it is the skill and experience of the person designing/implementing the controls that most determines their success. In addition to this, what one person might consider to be 'best practice' another may not (largely based on their respective experience). I have experienced this divergence of opinion on numerous occasions and it is this unavoidable variability that most encourages me to recommend a simple, site-specific limit against which compliance can be easily,

scientifically and impartially determined. Reliance on terms such as 'best practice erosion and sediment control measures shall be implemented' as a consent condition provide no certainty to either the issuing authority, the applicant, nor the contractor as to what type/level of control is expected or what outcomes must be achieved/avoided.

21. In summary, setting a TSS limit on stormwater discharges is common to New Zealand territorial authorities, and the most common limit is 100ppm. Mr. Laurenson proposes a TSS limit of 100ppm for stormwater discharges from established facilities, but rejects setting any TSS limit on construction phase discharges in favour of a method-based specification that he does not define. I have long experience of the limitations of relying on a 'best practice' condition in relation to setting a standard for erosion and sediment control, and do not recommend that this approach is adopted. In his evidence Mr. Laurenson supports the case for advocating use of source controls for managing stormwater discharge quality. I agree with this principle and believe that setting a TSS limit for construction phase stormwater discharges is an effective means for controlling this significant source of suspended sediment.

22. In responding to the Oil Companies' concern regarding TSS limit, I refer to Mr Norton's evidence in chief and in particular his paragraph 213 where he states that he does not believe that a single TSS limit for all development sites is an appropriate method for managing construction phase discharges, for reasons he explains in his paragraph 214. Instead Mr. Norton proposes development of a risk matrix to determine an appropriate TSS limit based on a range of contributory factors in his paragraph 117. This proposal aligns somewhat with that described by Mr. Reuther in his paragraph 268 of his s42A report. Both Mr. Norton and Mr. Reuther propose that the results of such a risk assessment be included as a condition of the approval issued by Council.

23. I understand that Mr. Norton agrees that a TSS limit is an appropriate method for managing construction phase stormwater discharges, but that the TSS limit should be defined on a case-by-case risk assessment basis.

24. I acknowledge that developing a matrix to enable TSS to be determined on a case by case basis would enable greater flexibility for Council to manage

discharge quality into its stormwater network than a single fixed limit, though I note that the condition I propose in my Evidence in Chief incorporates a degree of flexibility in this regard.

25. The issue would seem to be whether 100ppm is an appropriate maximum limit. Even if a risk matrix is developed to determine a TSS limit on a case-by-case basis, this will still require a maximum acceptable limit. I recommend a limit of 100ppm because:

    a) this is consistent with the maximum limit in the LWRP permitted activity rules;
    b) in my experience 100ppm is reasonably achievable on most sites with good erosion and sediment control;
    c) a lesser limit can be hard to achieve and could reach the point of diminishing returns referred to by Mr Sunich (paragraph 8.4 of his evidence);
    d) I am aware that Environment Canterbury rarely grants a resource consent to discharge more than this; and
    e) a higher limit might have adverse implications for Council as described below.

26. As owner and operator of the stormwater network I agree that it is appropriate for Council to set a maximum TSS limit for construction phase discharges. However, that limit would need to take into consideration (as a minimum) the ability for Council to deliver on the water quality outcomes included in the CSNDC, and operational costs of sediment removal from within the network. Whilst setting a limit higher than 100ppm might make erosion and sediment control measures less costly or onerous for developers, it could effectively pass the cost onto Council (by failure to comply with water quality outcomes and/or increased maintenance costs).

27. Other considerations for developing a matrix for determining TSS limits are:

    a) What factors will be included?
    b) the extent to which each contributory factor affects the resultant TSS limit.

c) will the TSS limit start at the highest limit acceptable to Council (and presumably Environment Canterbury) with each element that applies to a proposed discharge reducing that limit by a predetermined factor?

d) are there any elements that might increase the acceptable limit?

e) the accuracy of the 'real time' monitoring tools available for determining compliance (limits are only useful if compliance can be readily and reliably monitored)

f) will there be a minimum limit, or would the matrix identify sites that are too high risk to be accepted into the network?

g) will the matrix be made available to applicants, as an applicant would likely need to include sufficient information to enable the Council to determine a TSS limit (or to audit the appropriateness of a proposed limit)?

h) how and when will the matrix be developed, by whom, and who approves the final product?

i) what skill level, training, experience, and/or level of responsibility will be required to operate the matrix to determine an appropriate TSS limit on a case-by-case basis?

j) what effect will implementing the matrix have on processing time/cost for applications; could it become a (contentious) bottleneck?

28. In summary, I understand from my discussions with Mr. Norton that he agrees that a TSS limit is an appropriate method for managing construction phase stormwater discharges, but would like to see the limit set on a case-by-case basis. Whilst I acknowledge the potential benefits of this approach, in my opinion there is a significant number of uncertainties that would need to be clarified before the cost/benefit of this approach (as opposed to the condition I propose in my Evidence in Chief) could be determined. I therefore suggest wording similar to the following as a means for setting a TSS limit whilst also enabling development of the type of risk matrix preferred by Mr. Norton:

> *41(a). The holder of this consent shall develop a risk matrix for development sites and use it to determine a maximum total suspended solid (TSS) limit on any development site that discharges into the Christchurch City Council Stormwater Network.*

(b) The maximum TSS limit determined in accordance with condition 41(a) of this consent shall be included as a condition of the written authorisation for the discharge issued to the person responsible for the development site by the holder of this consent.

(c). Until such time as the risk matrix is developed, the concentration of total suspended solids in the discharge leaving the development site (or entering the Christchurch City Council Stormwater Network if an entrance is located on the development site) shall not exceed 100g/m^3.

MARK JAMES TIPPER

30 October 2018